University of British Columbia, Vancouver

Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

Date: April 5, 2023

Group Number: 30

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Helena Xu	92964121	w5e5o	hxxu2002@gmail.com
Jonah Townsend	42229864	w4j6r	jrtownsend47@gmail.com
Shaun Gao	74620345	h1u9u	sbshaun7@gmail.com

By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia.

OUR PROJECT: GameHaven

GameHaven: A wiki forum where users can document information, discuss, and chat about their favourite games!

The database models information about specific games and the people that contributed to them, uploaded by users. Our frontend allows users to find information about video games, franchises, studios, and more. In its current form, the application also allows users to upload, edit, and delete information about video games in the database, although ideally after more development they would be able to do so for all articles on the site and make their own posts referencing their favourite games.

FINAL SCHEMA

For our final schema, we removed the initial primary key field, which was originally an integer id, from the VideoGame, Franchise, Character, and Developer relations and changed the primary key to the `name` field. The reasoning for this change is that the `name` fields in these relations, with the exception of the Character relation, were already candidate keys. Moreover, the majority of the queries we implement do not rely on the `id` and instead are based upon the `name` field. As a result, we found that maintaining the `id` field for these particular relations was unnecessary.

In addition, we also changed all the BIT domain types in the Role relation to TINYINT. This is because we found that when displaying the BIT types in our UI, the data was displayed as an object instead of 1s and 0s.

Underline indicates primary key, **bold** indicates foreign keys, *italics* indicate candidate keys:

VideoGame(<u>name</u>: CHAR(50), release_date: DATE, genre: CHAR(20), synopsis: TEXT, rating: CHAR(4), sales: INT, **developer_name**: INT, start_date: INT, end_date: INT, **franchise_name**: INT) [NOT NULL: name]

Franchise(name: CHAR(50), description: TEXT) [NOT NULL: name]

Developer(<u>name</u>: CHAR(50), website_link: CHAR(50), description: TEXT) [NOT NULL: name, UNIQUE: website_link]

Country(country: CHAR(50), country_code: CHAR(4)) [NOT NULL: country_code]

Studio(<u>developer_name</u>: INT, year_established: INT, country: CHAR(50), phone_number: CHAR(15))

IndividualDeveloper(<u>developer_name</u>: INT, birthdate: DATE)

Characters(name: CHAR(50), description: TEXT, history: TEXT) [NOT NULL: name]

VoiceActor(<u>actor_id</u>: INT, name: CHAR(50), biography: TEXT, birthdate: DATE) [NOT NULL: name]

VideoGameHasCharacter(**game_name**: INT, **character_name**: INT, **actor_id**: INT, role: CHAR(20))

Post(<u>post_id</u>: INT, title: CHAR(50), body: TEXT, views: INT, **username**: CHAR(50)), time_created: DATETIME) [NOT NULL: title, body, views, username, time_created]

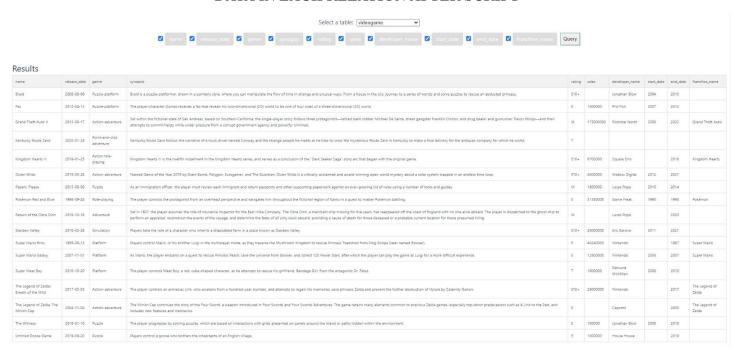
PostTagsVideoGame(**post_id**: INT, **game_name**: INT)

Comment(<u>comment_id</u>: INT, body: TEXT, **username**: CHAR(50), time_created: DATETIME, **post_id**: INT) [NOT NULL: body, username, time_created]

Users(<u>username</u>: CHAR(50), *email*: CHAR(50), password: CHAR(50), role: CHAR(20)) [NOT NULL: email, password, role, post_permission, remove_post_permission, change_roles_permission]

Roles(<u>role</u>: CHAR(20), post_permission: TINYINT, remove_post_permission: TINYINT, change_roles_permission: TINYINT) [NOT NULL: post_permission, remove_post_permission, change_roles_permission)

DATA IN EACH RELATION AFTER SCRIPT





Results

name	description
Grand Theft Auto	Grand Theft Auto (GTA) is a series of action-adventure games.
Kingdom Hearts	The series centers on the main character, Sora, and his journey and experiences with various Disney and Pixar characters, as well as some from Square Enix properties.
Pokémon	The franchise was created by Satoshi Tajiri in 1996, and is centred around fictional creatures called "Pokémon"
Super Mario	The Super Mario games are set primarily in the fictional Mushroom Kingdom, typically with Mario as the player character.
The Legend of Zelda	The series centres on the various incarnations of Link, a courageous young man of the elf-like Hylian race; and Princess Zelda, a magical princess who is the mortal reincarnation of the goddess Hylian



name	website_link	description
Capcom	www.capcom.com	Capcom Co., Ltd. is a Japanese video game developer and publisher.
Edmund McMillen		Edmund McMillen is an American video game designer and artist known for his Flash game visual style.
Eric Barone		Etic Barone, also known by his alias ConcernedApe, is an American video game developer, video game developer, video game developer, and musician.
Game Freak	www.gamefreak.co.jp	Game Freak Co., Ltd. is a Japanese video game developer, best known as the primary developer of the mainline Pokémon series of role-playing video games published by Nintendo and The Pokémon Company.
House House	househou.se	House House is an independent video game developer based in Melbourne, Australia.
Jonathan Blow	http://number-none.com/blow	Jonathan Blow is an American video game designer and programmer.
Lucas Pope	dukope.com	Lucas Pope is an American video game designer. He is best known for experimental indie games, notably Papers, Please and Return of the Obra Dinn.
Mobius Digital	www.mobiusdigitalgames.com	
Nintendo	nintendo.com	Nintendo Co_Ltd. is a Japanese multinational video game company headquartered in Kyoto. It develops and releases both video games and video game consoles.
Phil Fish		Phil Fish is a French Canadian former indie game designer best known for his work on the 2012 platform game Fez.
Rockstar North	rockstamorth.com	Rockstar North Limited (formerly DMA Design Limited) is a British video game development company and a studio of Rockstar Games based in Edinburgh.
Square Enix	square-enix.com	Square Enix Holdings Co., Ltd. is a Japanese multinational holding company, production enterprise and entertainment conglomerate, best known for its Final Fantasy, Dragon Quest. Star Ocean and Kingdom Hearts role-playing video game franchises, among numerous others.



country	country_code
Australia	61
Canada	1
Japan	81
United Kingdom	44
United States	1

Results

name	birthdate
Edmund McMillen	1980-03-02
Eric Barone	1987-12-03
Jonathan Blow	1971-01-01
Lucas Pope	
Phil Fish	1984-11-01



name	year_established	country	phone_number
Capcom	1979	Japan	
Game Freak	1989	Japan	(334) 674-387
House House	2014	Australia	
Mobius Digital	2013	United States	
Nintendo	1889	Japan	(800) 255-3700
Rockstar North	1987	United Kingdom	
Square Enix	2003	Japan	



name	description	Ratesy
Sowser	Bowser, or King Koopa. is a fictional character, the main antagonist in Nintendo's Mario franchise.	He is a large, powerful, fire-breathing Goops who leads the Koopa Troop, an evil kingdom of surfe-like creatures, and has been the arch nemess of Mario since his debut in Super Mario Stos. He has repeatedly lichtapped or attempted to lichtap Frincess Feach with the ultimate goal of detering Mario and skiling over the Mushroom Kingdom.
Calamity Ganon	A recurring major antagonist in The Legend of Zelda series.	Calamity Garon is Indian as a primal exit that has appeared throughout Hyrule's Interry.
Link	Link is the protagonist of the video game franchise The Legend of Zelda. He was created by Japanese video game designer Shigaru Miyamoto.	Unit is the soul of a legendary here that throughout history is reincurrated within a seemingly cridinary boy or man when the need arises for a new varior to deleast the forces of evil.
Luigi	Luigi is Mario's younger twin brother and the secondary protagonist of the Mario franchise.	Throughout his life, he has lived in Mario's chadow, developing both cowardly and hereic sendencies. Despite this, Luigi has helped and Sought alongoids his brother on many occasions.
Mario	Mario is the title character of the video game franchise of the same name and the mascot of Japanese video game company Nintendo.	Mario is depicted as a portly plumber who lives in the fictional land of the Mushroom Kingdom with Luigi, his younger, taller brother.
Red	Red is the canon name of the protagorist of the Generation I games and is a Pokemon Trainer from Pallet Town, Kanto.	Red is known throughout the Polehon world as the Champion from Palest Town, as well as a living legand for his defeat of Saan Rocket in Cano during his quest.
tiku	Fiku is a caim, cool, collected teenager who is not afraid to push the boundaries. He is tall and muscular with pale skin, bright blue-green eyes and silver hair.	Riks is introduced as a ternaper who wishes to visit other words with this finance Sors and Calif. After a way to other words is opened. Riks meets the evil fairy Mainfoort who pits him against Sors, leading to distincts and ultimately being possessed by Ansem, Seeker of Darkness. Riks is feed thanks to Sors and returns as a protagonal in following games.
Sora	Sora is the main protagonist and main playable character in most of the Kingdom Hearts series.	He is a Significate visible from the Destiny blands where he along with his childhood friends fills and Clark destinating away to find our what lies begond their horse.
'eshi	Yoshi is a dinocaur-like character that acts as an ally of Mario and Luigi	Among members of the Yoshi species halling from Yoshi's sload, any Yoshi may be identified as the "Yoshi" diseascer and as such, not all iterations of the character are excessely the same one.
Zelda	Zelda is a princess and member of the royal family of Hynule. She is typically depicted with blonde or brown hair and blue eyes and wears a royal dress, dars and jewellery.	In many games, Zeids is captured by the antagonist Ganon, nocessitating Link to come to her recove. It several games the is one of the Sages or Champions whose herolom is essential to defeating Ganon: in others. Like Occarins of Time and The Wind Wides the adopts attendance personant take a more active role in the story. In Dynamic Sword, she is established as the mortal reincurrence of the goodest hyle which gives her incomplotors a range of marginal powers.



actor_id	name	biography	birthdate
1	Kengo Takanashi	Kengo Takanashi is a Japanese voice actor, affiliated with Arts Vision.	1986-06-12
2	Charles Martinet	Charles Martinet is an American actor and voice actor, known for his portrayal of both Mario and Luigi in the Super Mario video game series since 1992.	1955-09-17
3	Patricia Summersett	Patricia Summersett is a Canadian actress, best known for voicing. Princess Zelda in The Legend of Zelda: Breath of the Wild and Hyrule Warriors: Age of Calamity.	1983-03-19
4	Haley Joel Osment	Haley Joel Osment is an American actor and voice actor.	1988-04-10
5	David Gallagher	David Lee Gallagher is an American actor and former model.	1985-02-0
6	Fujiko Takimoto	Fujiko Takimoto is a Japanese voice actress from Osaka Prefecture, Japan.	1967-11-0
7	Hikari Tachibana	Hikari Tachibana is a Japanese voice actress.	1973-09-1
8	Frank Welker	Franklin Wendell Welker is an American voice actor. He began his career in the 1960s, and holds over 860 film, television, and video game credits as of 2022, making him one of the most prolific voice actors of all time.	1946-03-12
9	Harvey Atkin	Elliot Harvey Atkin was a Canadian actor best known for his roles as Morty Melnick in Meatballs, Sergeant Ronald Coleman in Cagney & Lacey, and for voicing King Koopa in The Super Mario Bros.	1942-12-11
10	Tsuguo Mogami	Tsuguo Mogami is a Japanese voice actor from Saitama Prefecture, Japan.	1980-01-1



game_name	character_name	actor_id	character_role
Kingdom Hearts III	Riku	5	Playable
Kingdom Hearts III	Sora	4	Playable
Pokémon Red and Blue	Red		Playable
Super Mario Bros.	Bowser	9	Antagonist
Super Mario Bros.	Luigi	2	Playable
Super Mario Bros.	Mario	2	Playable
Super Mario Bros.	Yoshi	8	Supporting
Super Mario Galaxy	Bowser	9	Antagonist
Super Mario Galaxy	Luigi	2	Playable
Super Mario Galaxy	Mario	2	Playable
The Legend of Zelda: Breath of the Wild	Calamity Ganon	10	Antagonist
The Legend of Zelda: Breath of the Wild	Link	1	Playable
The Legend of Zelda: Breath of the Wild	Zelda	3	Supporting
The Legend of Zelda: The Minish Cap	Link	6	Playable
The Legend of Zelda: The Minish Cap	Zelda	7	Playable



post_id	title	body	views	username	time_created
1	Review of the game	I played the game for 50 years since I was 7-year old in 2001, I really enjoyed the game. Highly recommended!	17	andy613	2021-01-25
2	Looking for some advices	Hello I am new to the game, need some advices!	111	andy613	2023-02-21
3	Anyone else had this bug?	The game just crashed for no reason	5	allend	2023-02-21
4	My favorite video game character	I just wanted to share my love for my favorite video game character.	15	john	2023-02-22
5	Video game blog!	Hey everyone, I decided to have a blog for myself, I'll post updates daily, please follow!	8	andy613	2023-02-25



post_id	game_name
4	Fez
3	Outer Wilds
1	Pokémon Red and Blue
4	Super Mario Galaxy
2	Untitled Goose Game

Results

username	email	user_password	user_role
allend	631938@gmail.com	securePassword	member
andy613	andy6138213@gmail.com	UIQHE@3h8@JQO_{@	admin
jk222	jk22201@gmail.com	password3838	sub_admin
john	johnkkkkm@gmail.com	absolqjwk139	banned
random	sbshaun2019@gmail.com	92109211k	admin



comment_id	body	username	time_created	post_id
1	great game!	andy613	2023-02-25	1
2	really enjoyed playing	jk222	2023-02-24	2
3.	add me: y89019	random	2023-02-23	1
4	the game is classic, everyone should give it try!	jk222	2023-02-22	1
5	lol the game is so badly designed	allend	2023-02-21	3



user_role	post_permission	remove_post_permission	change_roles_permission
admin	1	1	1
banned	0	0	.0
developer	1	1	/1
member	11	0	0
sub_admin	1	1	0

SQL Queries in Code

INSERT Operation

server/src/controllers/videogameController.ts: 112

```
await queryAsync('INSERT INTO videogame SET ?', [game]);
```

DELETE Operation

server/src/controllers/videogameController.ts: 176:

```
try {
    await queryAsync('DELETE FROM videogame WHERE name = ?', [name]);
    res.status(200).json({ message: 'Videogame deleted' });
} catch (err: any) {
    res.status(500).json({ error: err.message });
}
```

UPDATE Operation

server/src/controllers/videogameController.ts: 161

```
await queryAsync('UPDATE videogame SET ? WHERE name = ?', [game, name]);
```

Selection

server/src/controllers/videogameController.ts: 47

```
44
         let guery = `SELECT ${sanitizedColumns.join(', ')} FROM videogame`;
45
         if (ratingFilter) {
46
             query += 'WHERE rating = ?'; You, 4 days ago • added rating sele
47
48
49
50
         try {
             const results = await queryAsync(query, [ratingFilter]);
52
             res.status(200).json(results);
53
         } catch (err: any) {
54
             res.status(500).json({ error: err.message });
55
```

Projection

server/src/controllers/projectionController.ts: 30

Join

server/src/controllers/DeveloperController.ts: 29

```
sql: `SELECT *
FROM developer D, studio S, country C
WHERE D.name = S.name
AND S.country = C.country
AND D.name = '${name}'',
```

Aggregation with Group By

server/src/controllers/StatsController.ts: 11

```
`SELECT ${group} AS category, ${measurement}(sales) AS result FROM videogame
WHERE ${group} IS NOT NULL
GROUP BY ${group}`,
```

Aggregation with Having

server/src/controllers/StatsController.ts: 27

```
`SELECT ${group} AS category, COUNT(*) AS result FROM videogame
WHERE ${group} IS NOT NULL
GROUP BY ${group}
HAVING result ${body.operation} ${body.count} ORDER BY result DESC`
```

Nested Aggregation with Group By

server/src/controllers/FranchiseController.ts: 45

```
`WITH SalesTemp AS (
    SELECT ${group} AS category, ${measurement}(sales) AS result FROM videogame
    WHERE ${group} IS NOT NULL
    GROUP BY ${group}
)

SELECT * FROM SalesTemp
WHERE result = (SELECT ${extrema}(result) FROM SalesTemp)`,
```

Division

server/src/controllers/FranchiseController.ts: 17

```
SELECT * FROM characters C WHERE NOT EXISTS(

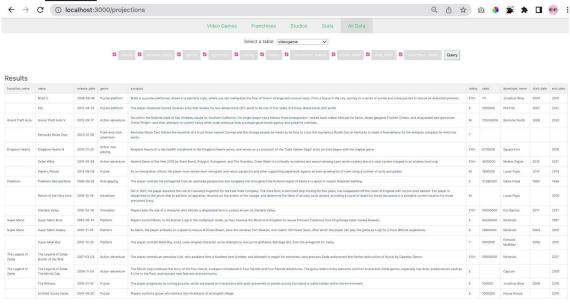
SELECT * FROM videogame V WHERE franchise_name = '${franchiseName}' AND NOT EXISTS (

SELECT * FROM videogamehascharacter WHERE game_name = V.name AND character_name = C.name
)
),
```

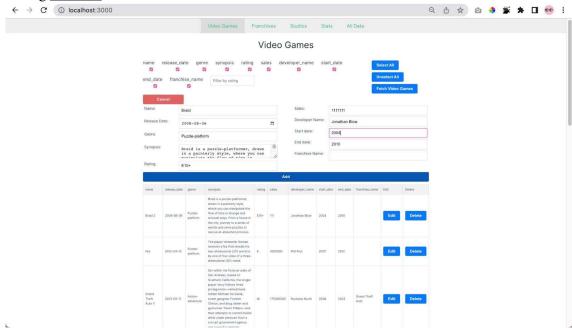
SQL Queries And Demonstration Of Functionalities

INSERT

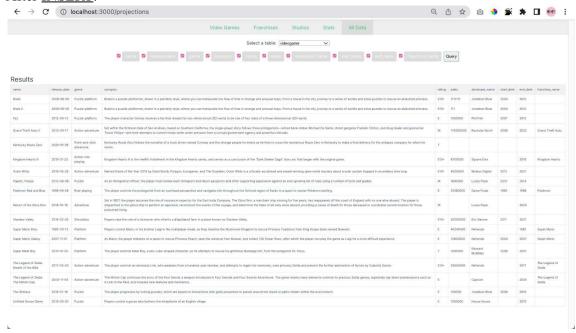
Before **INSERT**:



During **INSERT**:

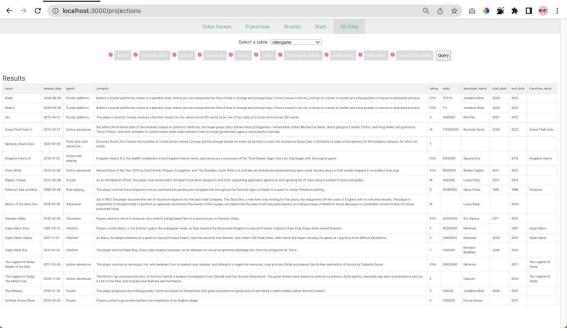


After **INSERT**:

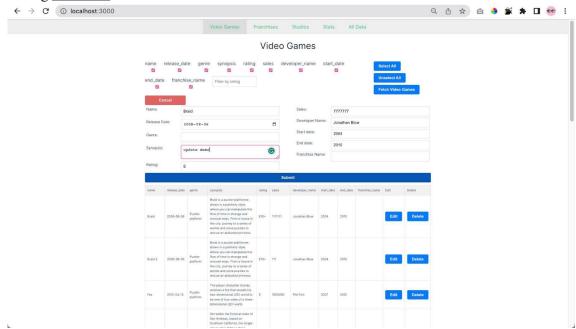


UPDATE

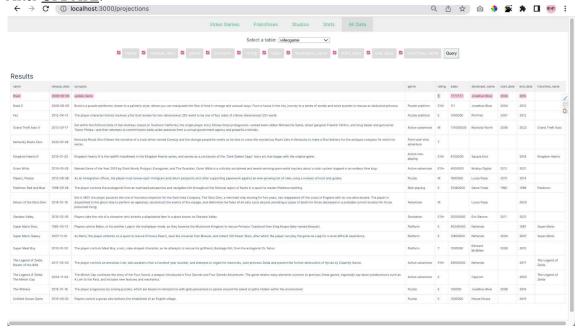
Before **UPDATE**:



During **UPDATE**:



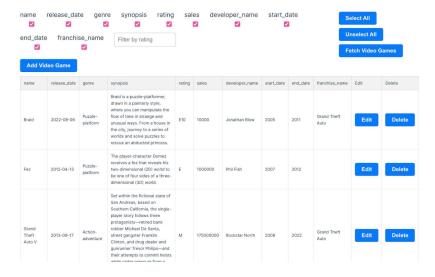
After **UPDATE**:



SELECTION

Before **SELECTION**:

Video Games



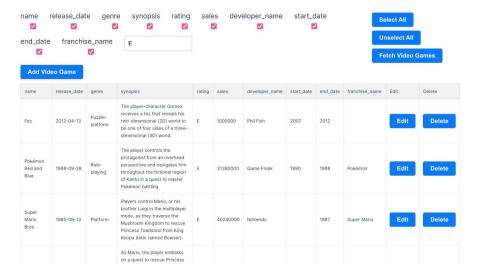
During **SELECTION**:

Video Games



After **SELECTION**:

Video Games

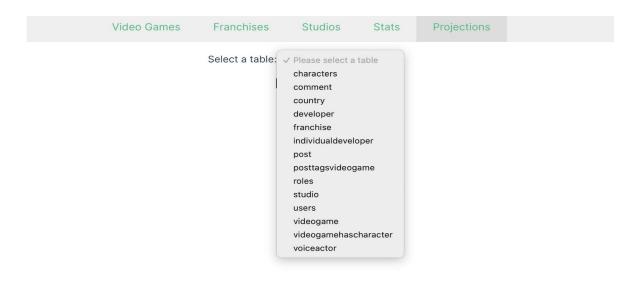


PROJECTION

Before **PROJECTION**:

	Video Games	Franchises	Studios	Stats	Projections			
Select a table: Please select a table ~								
Results								

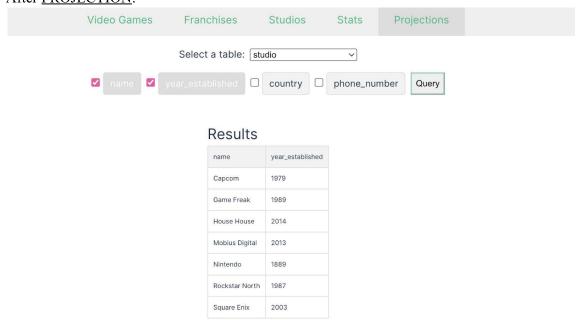
During <u>PROJECTION</u>: 1. Select a table



2. Select columns

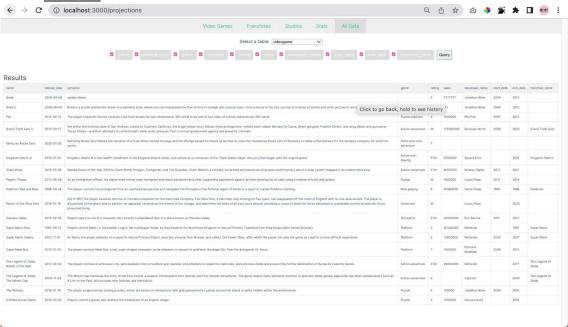


After **PROJECTION**:

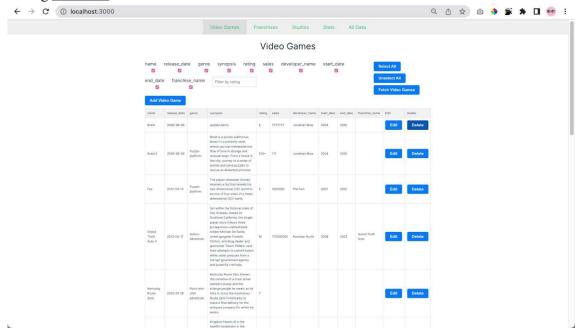


DELETE

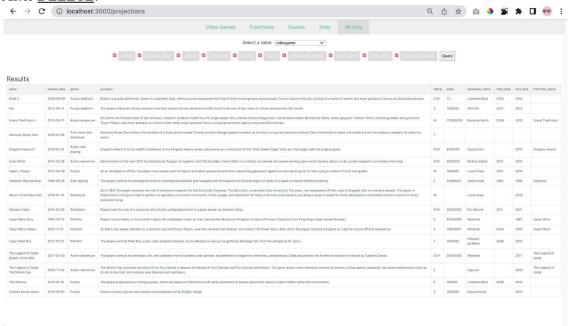
Before <u>DELETE</u>:



During **DELETE**:

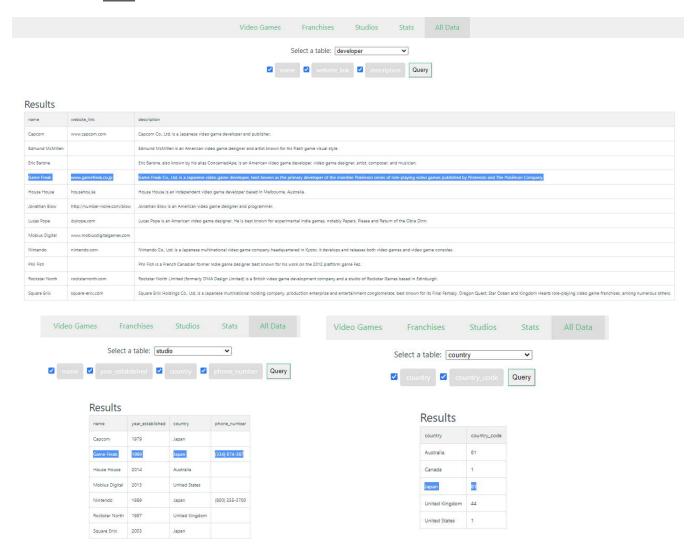


After **DELETE**:

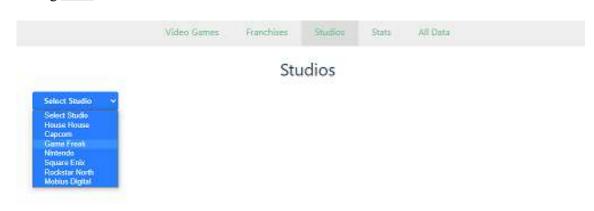


JOIN

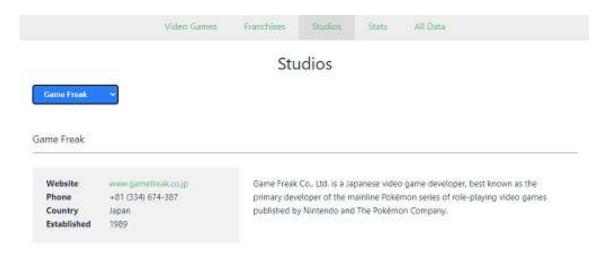
Before JOIN:



During JOIN:



After JOIN:



DIVISION

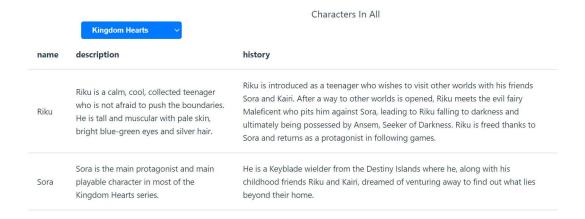
Before **DIVISION** applied:



During **DIVISION**:



After <u>DIVISION</u> applied: Finds the characters that appear in every single video game in the franchise



AGGREGATION WITH GROUP BY

• User can choose to groups video games by either franchise, rating or genre, and can apply the SUM and AVG aggregation to finds the total sales/average sales for each

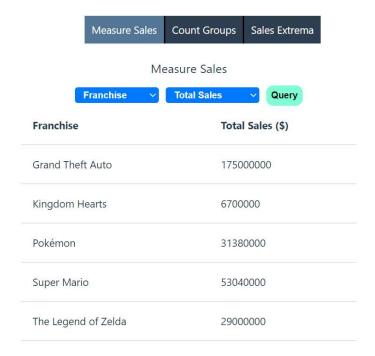
Before:



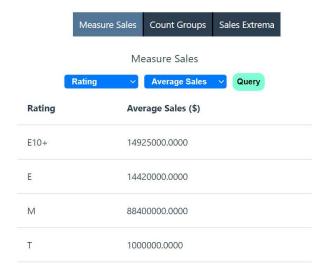
During Aggregation:



After SUM aggregation with GROUP BY franchise:



After AVG aggregation with GROUP BY rating:



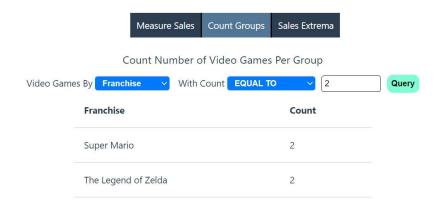
AGGREGATION WITH HAVING

• User can group video games by either franchise, rating or genre and display the ones that have a count equal to, greater than, less than, greater than or equal, less than or equal, or not equal to the specified amount

Before:



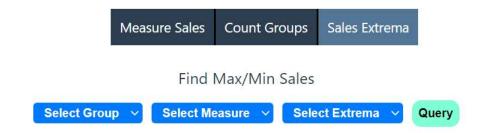
After: Finds the franchises that have more than 2 video games in them



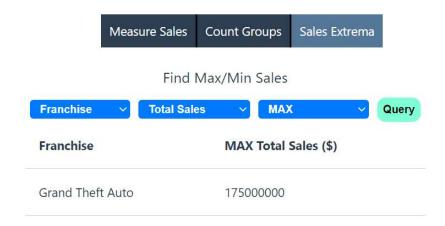
NESTED AGGREGATION WITH GROUP BY

• User can find the franchise, rating or genre with the highest/lowest total sales or average sales

Before:



After: The franchise with the max total sales



After: The genre with the minimum average sales

